

WHAT IS CLAIMED IS:

1. A method for ranging in a radio frequency communications system, the method comprising:
  - selecting a transmission channel class that includes at least one of transmission rate, modulation scheme, coding scheme, and transponder footprint;
  - transmitting a ranging message according to the selected transmission channel class over a channel; and
  - selectively modifying the transmission channel class based upon characteristics of the channel.
2. A method according to claim 1, further comprising:
  - storing parameters associated with the transmission of the message over the channel, the parameters including at least one of power information and timing information associated with the transmission of the message.
3. A method according to claim 1, wherein the transmitting step and the modifying step are iteratively performed to achieve an improved transmission class.
4. A method according to claim 1, wherein the modifying step is performed periodically in response to a change in the characteristics of the channel.
5. A method according to claim 1, wherein the radio frequency communications system includes a satellite configured to support two-way communication.
6. A method according to claim 5, further comprising:
  - receiving a request to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.
7. A method according to claim 1, further comprising:
  - altering the transmission channel class for load balancing.
8. A terminal apparatus for supporting ranging over a radio frequency communications system, the apparatus comprising:
  - a transmit unit that is configured to transmit a ranging message according to a selected transmission channel class that includes at least one of transmission rate, modulation scheme, coding scheme, and transponder footprint over a channel ; and
  - means for selectively modifying the transmission channel class based upon characteristics of the channel.
9. An apparatus according to claim 8, further comprising:

memory configured to store parameters associated with the transmission of the message over the channel, the parameters including at least one of power information and timing information associated with the transmission of the message.

10. An apparatus according to claim 8, wherein the transmission rate is increased to a value that is sustainable by the channel.

11. An apparatus according to claim 8, wherein the transmission rate is periodically modified in response to a change in the characteristics of the channel.

12. An apparatus according to claim 8, wherein the radio frequency communications system includes a satellite that supports bi-directional communication.

13. An apparatus according to claim 12, further comprising:  
a receive unit configured to receive request to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.

14. An apparatus according to claim 8, wherein the transmission channel class is altered for load balancing.  
a receive unit configured to receive a request to perform re-ranging for load balancing.

15. A computer-readable medium carrying one or more sequences of one or more instructions for ranging in a radio frequency communications system, the one or more sequences of one or more instructions including instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of:

selecting a transmission channel class that includes at least one of transmission rate, modulation scheme, coding scheme, and transponder footprint;

initiating transmission of a ranging message according to the selected transmission channel class over a channel; and

selectively modifying the transmission channel class based upon characteristics of the channel.

16. A computer-readable medium according to claim 15, wherein the one or more processors further perform the step of:

storing parameters associated with the transmission of the message over the channel, the parameters including at least one of power information and timing information associated with the transmission of the message.

17. A computer-readable medium according to claim 15, wherein the transmitting step and the modifying step are iteratively performed to achieve an improved transmission class.

18. A computer-readable medium according to claim 15, wherein the modifying step is performed periodically in response to a change in the characteristics of the channel.

19. A computer-readable medium according to claim 15, wherein the radio frequency communications system includes a satellite configured to support two-way communication.

20. A computer-readable medium according to claim 19, wherein the one or more processors further perform the step of:

receiving a request to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.

21. A computer-readable medium according to claim 15, wherein the one or more processors further perform the step of:

altering the transmission channel class for load balancing.

22. A method for ranging in a radio frequency communications system, the method comprising:

receiving a ranging message from a terminal over a channel associated with a transmission channel class that includes at least one of transmission rate, modulation scheme, coding scheme, and transponder footprint;

performing ranging measurements corresponding to the message; and

outputting a ranging response message based upon the ranging measurements, the ranging response being transmitted to the terminal, wherein the terminal selectively modifies the transmission channel class based upon the ranging response.

23. A method according to claim 22, wherein the terminal stores parameters associated with the transmission of the message over the channel, the parameters including at least one of power information and timing information associated with the transmission of the ranging message.

24. A method according to claim 22, wherein the transmission rate is increased to a value that is sustainable by the channel.

25. A method according to claim 22, wherein the transmission rate is periodically modified by the terminal in response to a change in the characteristics of the channel.

26. A method according to claim 22, wherein the radio frequency communications system includes a satellite configured to support two-way communication.

27. A method according to claim 26, further comprising:

transmitting a request to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.

28. A method according to claim 22, further comprising:

altering the transmission channel class for load balancing.

29. A computer-readable medium carrying one or more sequences of one or more instructions for ranging in a radio frequency communications system, the one or more sequences of one or more instructions including instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of:

performing ranging measurements corresponding to a ranging message received from a terminal over a channel associated with a transmission channel class that includes at least one of transmission rate, modulation scheme, coding scheme, and transponder footprint; and

outputting a ranging response message based upon the ranging measurements, the ranging response being transmitted to the terminal, wherein the terminal selectively modifies the transmission channel class based upon the ranging response.

30. A computer-readable medium according to claim 29, wherein the terminal stores parameters associated with the transmission of the message over the channel, the parameters including at least one of power information and timing information associated with the ranging transmission of the message.

31. A computer-readable medium according to claim 29, wherein the transmission rate is increased to a value that is sustainable by the channel.

32. A computer-readable medium according to claim 29, wherein the transmission rate is periodically modified by the terminal in response to a change in the characteristics of the channel.

33. A computer-readable medium according to claim 29, wherein the radio frequency communications system includes a satellite configured to support two-way communication.

34. A computer-readable medium according to claim 33, wherein the one or more processors further perform the step of:

transmitting a request to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.

35. A computer-readable medium according to claim 29, wherein the one or more processors further perform the step of:

altering the transmission channel class for load balancing.

36. A satellite communications system comprising:

a terminal configured to perform ranging to determine a target transmission rate among a plurality of transmission rates by transmitting a ranging message over a satellite; and  
a hub configured to receive the ranging message and to perform ranging measurements corresponding to the message, the hub outputting a ranging response message that includes ranging parameters, the ranging response being transmitted to the terminal, wherein the terminal adapts the target transmission rate based upon the ranging response.

37. A system according to claim 36, wherein the terminal includes memory configured to store the ranging parameters, the parameters including at least one of power information and timing information associated with the transmission of the ranging message.

38. A system according to claim 36, wherein the terminal iteratively transmits the ranging message to determine a maximal transmission rate for the target transmission rate.

39. A system according to claim 36, wherein the transmission rate is periodically modified in response to a change in the characteristics of the channel.

40. A system according to claim 36, wherein the satellite supports bi-directional communications.

41. A system according to claim 40, wherein the hub instructs the terminal to perform re-ranging based upon re-ranging criteria that includes at least one of location of the satellite, and the characteristics of the channel.

42. A system according to claim 36, wherein the hub instructs the terminal to modify the target transmission rate to perform load balancing.